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ABSTRACT

This unit uses energy choices to raise questions about the energy option of coal available to the nation along with attendant advantages and disadvantages of this option. The unit introduces locations of coal deposits in the U.S. and their types. Emphasis is on relatively unexploited deposits in the western United States. Comparisons are made between western coal and that of the east. Heat and sulfer content are discussed. Possible boom town effects are discussed in the context of development of resources. Strip mining controversies are examined. (Author/RE)

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Interdisciplinary Student/Teacher Materials in Energy, the Environment, and the Economy

Western Coal: Boom or Bust?

Grades 9-11

June 1979

National Science Teachers Association

Prepared for
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June 1979
John M. Fowler
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Western Coal: Boom or Bust?

Introduction

This unit uses some of the energy choices which face this country to raise some questions about how we decide between the advantages and disadvantages of certain energy options, and how people think, feel, and behave when they have to make important decisions. This packet prompts students to consider some questions about future uses of coal, our nation's largest fossil fuel energy reserve.

The first lesson introduces the locations of coal deposits in the United States, their type and kind, and, in particular, examines the large western deposits which are relatively unexploited and are now receiving more attention. It looks at the advantages of western coal over coal in the east, and discusses the heat and sulfur content of major coal types. Eastern and western coal reserves are then examined.

The second lesson describes boom town growth and introduces the factors which determine the location of future boom towns. The lesson highlights map, graph, and chart studies.

Lesson three first looks at the conflicting opinions underlying the controversy over strip-mining and open ranges of the Plains states. It identifies various points of view and describes what to do to have a better understanding of the arguments used to support a particular point of view.

The final lesson describes life in a boom town. It explains the complexity of decision-making under the strain of rapid population growth.

The unit is designed for use in senior high school history and American Studies classes.

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T - Teacher Manual

Teacher Manual

To the Teacher

The purpose of the Teacher Manual is to help you use Western Coal: Boom or Bust? to best advantage when infusing energy-related topics into your Social Studies, American History, Science, Physical-Cultural, Geography, Political, Social or Economic Issues course. The Teacher Manual consists of two parts: (1) an introduction (see table of contents on the previous page), and (2) the main ideas, strategies, materials, and attainable goals for each classroom lesson (printed in light gray).

You will find the students' material printed on white stock behind this Teacher Manual. These exercises and activities can be easily duplicated into classroom sets. Complete student material for each lesson has been provided (see table of contents).

1. Should Surface Mining Win the West?

Overview

This introductory lesson is designed to interest students in the nation's energy dilemma, and to acquaint them with some of the complex and difficult problems that inevitably accompany intensive extraction and production of coal.

Objectives

Students should be able to:

1. Determine how much coal the U.S. has in estimated reserves.
2. Locate western sites of strippable coal.
3. Describe and evaluate various types of coal.
4. Estimate relative costs of coal against a number of variables.

Target Audience

Social Studies, Science.

Time Allotment

One-two class periods.

Materials

Table: "Location of U.S. Coal Reserves," p 39
Map: "Distribution of United States Coal Resources," p 40
Graph 1: "Heat Content of Major Coal Types," p 41
Graph 2: "Sulfur Content of Eastern and Western Coal," p 42
Student Activity Sheet, p 43

Teaching Strategies

Before the students are presented with the activity involving the use of a map and table, you may wish to alert them to some misconceptions about the location of large coal deposits. "Where would you expect to see mining operations in the United States?" More often than not, students will reel off the names of several eastern states -- West Virginia, Pennsylvania, etc. "Why did you think of these states? Where and when do you hear about coal?" Students will probably mention that coal is often linked with strikes, disasters, and strip-mining.

Introduce the topic of underground mining and, when it seems appropriate, turn the discussion towards strip-mining -- how it changes the landscape, the size of the draglines, the amount of overburden that is moved before the seam is exposed, etc. Any encyclopedia can give the students a modest acquaintance with the general techniques used in strip-mining, illustrating the steps with pictures. Refer students to these, or assign a one-page report on the topic of the strip-mining process. Students should be made aware that strip-mining presents different environmental and occupational safety hazards than does underground mining.

Develop the topic by mentioning that coal is indeed closely linked to the economics of Appalachian and Midwestern states, and that most of the coal use today comes from these regions. However, we need more coal than we can get from these states. "Where do you think we may get the amount of coal we will need in the future?" (Students' responses will vary widely. Many will mention western states.)

Table

Introduce the table: "Location of U.S. Coal Reserves." Have students check their guess with the table. Then ask these questions:

1. Which five states have the greatest amounts of coal? *(Montana, Illinois, Wyoming, West Virginia, Pennsylvania.)*

2. Which four have the greatest potential for strip-mining? *(Montana, Wyoming, North Dakota, Illinois.)*

3. Which five are rich in underground coal? *(Montana, Illinois, Wyoming, West Virginia, Pennsylvania.)*

Map

Distribute the map: "Distribution of United States Coal Resources." Allow sufficient time for the students to acquire and process information from it. Then ask:

1. Which two regions contain mostly bituminous coal? *(The East and Midwest.)*

2. In which region can anthracite coal be found? *(The East.)*

3. Which region contains large deposits of lignite and subbituminous coal? *(The West.)*

4. Which regions have large reserves of subbituminous coal that may be opened for strip-mining? *(The West.)*

Distribute Graphs 1 and 2 illustrating the heat and sulfur contents of different types of coal. Have students read the graphs, then answer the questions, using their own paper.

Graph 1

1. What does this graph show? *(The graph shows the heat content of different types of coal.)*

2. Finish this sentence: The greater number of BTU's, the *(more heat per ton the coal gives off).*

3. Looking only at this graph, why might utility operators wish to buy anthracite or bituminous coal instead of subbituminous or lignite? *(Bituminous and anthracite coal produce more heat per pound than the other types.)*

4. Yet subbituminous coal is much in demand today. What could be one reason? Can you think of others? *(Answers will vary, however, students should mention that subbituminous coal has less sulfur content and would, therefore, produce less sulfur dioxide pollution in burning.*

   Utility operators buy coal on BTU content, sulfur content, moisture, ash, and in the case of lignite, even sodium content. In the final analysis, utility operators buy coal which will provide the most wattage for the lowest cost.)

Graph 2

1. What does this graph show? *(The sulfur content of western and eastern coal.)*

2. According to this graph, does all coal contain sulfur? *(Yes, all appear to contain sulfur.)*

3. Which region of the United States has the large deposits of low sulfur coal? *(The West.)*

Extending the Lesson

Distribute the Student Activity Sheet to the students. Ask them to decide on their coal purchase and support their choice with information from the prepared sources -- the map, graphs, table -- in this lesson, in addition to the chart.

(Montana:

-cost for 1 ton:
$9.00 cost of the ton of coal
1 ton x 1,270 mi = 1,270 ton mi x $.01/ton mi =
$12.70 cost of transportation mine to plant.

-total cost per ton = $9.00 + $12.70 = $21.70

-cost per million BTU = $21.70 ÷ 18 =
$1.20⅝ or about $1.21 per million BTU's.

West Virginia:

-cost for 1 ton:
$27.00 cost of the ton of coal
1 ton x 360 mi = 360 ton mi x $.02/ton mi =
$7.20 cost of transportation mine to plant.

-total cost per ton = $27.00 + $7.20 = $34.20

-cost per million BTU = $34.20 ÷ 26 = $1.32
$1.32 + $.50 for antipollution devices =
$1.82 per million BTU's.

Therefore, coal from Montana is cheaper than coal from West Virginia.

Then a second problem. If the utility were at Detroit, Michigan, then:

only distance changes -

Montana=1,700 miles
$26.00/ton
$1.44/million BTU's

West Virginia=350 miles
$34.00/ton
$1.82 /million BTU's)

2. Where Are the Coal Boom Towns of the American West?

Overview

In this lesson students learn that just as there were once boom towns in the 19th century West, today another series of boom towns is rising in the Rocky Mountain states. However, instead of gold or silver pulling people West, today it is coal -- strippable coal in billions of tons.

Where are the coal boom towns? The location depends on where the coal is, but also where there are railroads, roads and other vital supply lines. The factors are discussed.

Objectives

Students should be able to:

1. Predict the location of future boom towns by acquiring information from maps, charts, and graphs.
2. List some of the factors which can create a boom town or cause it to fizzle.

Target Audience

Social Studies, American History.

Time Allotment

One-four class periods.

Materials

Map 1: "Strippable Coal Reserves in Rocky Mountain States," p. 45
Map 2: "Northeastern Wyoming Towns and Transportation Network," p 48
Map 3: "Future Fuels-Related Projects in Wyoming," p 49
Map 4: "Future Fuels-Related Projects in Montana," p 50
Tables: "Present and Future Employment Needs for Five Counties in Wyoming," pp 46-47

Road Map or Classroom Wall Map
Atlantes

Teaching Strategies

One good way to begin this lesson is to encourage students to examine the traditional ghost towns of the West. Assign students to research historical 19th century boom towns and report on these to the class. Have students research Deadwood (South Dakota), Leadville (Colorado), and Virginia City (Nevada) in greater detail by assigning small groups to study these.

Distribute Map 1: "Strippable Coal Reserves in Rocky Mountain States." Ask students to list the states with deposits of bituminous coal. Subbituminous? Which have deposits of lignite?

Bituminous	Subbituminous	Lignite
Montana	*Montana*	*North Dakota*
Utah	*Wyoming*	*South Dakota*
Colorado	*Colorado*	*Montana*
New Mexico	*New Mexico*	
Arizona		

Explain the following terms. Have students write each definition in their notebooks.

Strip-mining - a process of recovering coal from the earth by stripping away the surface earth and laying bare the coal deposits which can then be removed by surface equipment. No underground mines have to be dug.

Bituminous coal - comparatively hard coal having the most heat potential of the three types of coal listed here.

Subbituminous coal - not as hard as bituminous coal with less heat content.

Lignite coal - the softest of the three types of coal listed here with the least heat content.

Coal gasification - a process of making synthetic gas from coal.

Sulfur content - coal contains varying amounts of sulfur which pollute the air unless it is removed before or after it is burned. Western coal is very low in sulfur.

Map Study

Ask students to look carefully at Map 1 and answer True, False, or Can't Tell to the following statements based on the map information.

1. Denver, Colorado will become a coal strip city. *(False. Coal near Denver is not strippable coal.)*

2. Wyoming has large deposits of strippable coal. *(True.)*

3. Wyoming has more strippable coal than Montana. *(Can't Tell. Map only shows location of coal, not amounts.)*

4. Most coal in the Rocky Mountain states is strippable lignite. *(False.)*

5. In terms of surface area, there are more deposits of subbituminous coal than bituminous. *(True. The dotted area is larger than the vertically stripped area showing bituminous coal deposits.)*

6. The map shows the location of coal boom towns. *(False. The map shows where the coal is, not where the towns are located.)*

Jobs in Boom Towns

This portion of the lesson asks students to study the impact of strip-mining on jobs, both in type and in quantity.

Have students list as many occupations as they can think of that are in some way connected to strip-mining industries. Encourage them to list supportive service jobs as well. What jobs in nearby larger towns will be in demand? (Help students think of jobs in recreation, health, in providing necessary goods and services, and specialist jobs.)

Categorize the job lists. Will more jobs become available at the mines or in associated and supportive industries?

Coal Mining

shovel operators
mechanics
others (there are many more)

Transportation

truck drivers
railroad engineers
gas station attendants
clerks in the office
mechanics

Retail Sales

shoe salesperson
counterhelp at a fast food restaurant
salesperson in department store

Banking Finance

tellers in the banks
loan specialists
credit investigators
accoutants

Construction

cement workers
brick layers
carpenters
electricians
plumbers
roofers

Science Technology

chemists
engineers
electrical
mechanical
civil
industrial
environmental
hydrologists
geologists

Education

teachers
principals
counselors

Health/Personal Care

doctors
nurses
pharmacists
barbers and hairdressers

Distribute the tables showing "Present and Future Employment Needs for Five Counties in Wyoming." Have students answer questions about industrial and population growth in these counties.

1. Which counties might expect to see a large number of job-seekers by 1980? What industries in these counties will probably be hiring large numbers of workers in this same year, and more in 1985?
   (Campbell and Converse Counties; Industries are: coal mining, uranium mining projects, construction, synthetic gas, and railroads.)

2. What do you predict will be the growth in Weston County, Wyoming between the years 1980-1985? Give a reason.
   (Very little growth, probably because strip-mining will not be extensive.)

3. Converse County can expect fairly heavy growth in which two industries by the year 1985?
   (Coal mining; uranium mining and milling.)

4. Defend or criticize this statement: Johnson County can expect boom town conditions by the year 1985.
   (It will probably not become a boom town. Data show nearly zero growth predicted.)

5. Natrona County will probably have li[illegible] or no coal mining or synthetic gas pla[illegible] in production during the next 25 years. [illegible], then, do planners expect the whole [illegible]y, but particularly Casper City, to gr[illegible] population as a result of coal boomp[illegible] other counties?
   (Probably because Casper City can provi[illegible] area boom towns with goods, services, and specialists in all areas of expertise not yet available in small towns.)

Further Map Study

Look carefully at the map of "Northeastern Wyoming Towns" and "Transportation Network." What factors will cause Gillette, Wyoming to triple its growth?

(Some reasons are:

-closeness to railroads
-strip-mining (Look back at other maps before deciding on this factor.)
-nearby interstate and state roads
-city is centrally located in the county
-mild climate year around)

Using all the Data

Have the students answer these questions:

1. Which towns in Converse and Johnson Counties will probably experience the most rapid growth over the next ten or fifteen years? Why?
   (Buffalo in Johnson County; Douglas in Converse County. Reasons include availability of roads, railroads, and site location.)

2. Suppose you are planning official for the state of Wyoming. Coal strip-mining plans include the southeast corner of Johnson and the northeast section of Converse County. Which two towns in these parts will probably grow quickly and need state financial and planning assistance?
   (Towns of Bill and Linch.)

3. As a planner, what road construction in these areas would you recommend? Where would a rail line help?
   (Widen State Route 59; build new highway between Gillette and Douglas; build highway from Newcastle to Linch and Kaycee.)

4. An alternative to adding growth to existing towns is the planned new community. Where do you think such a new community might be located?
(Probably somewhere near the four corner area of Campbell, Weston, Converse, and Niobrara Counties. Perhaps near the cross road of a new and old road, such as between Newcastle and Linch on Route 59.)

5. What physical and human factors should be considered in planning for growth, or anticipating the locations of boom towns?

(Physical Factors	*Human Factors)*
1. Amount of water available for industry and homes.	*1. "Quality of life" in existing towns.*
2. Topography of land.	*2. Attitudes of citizenry and town officials toward newcomers and surface mining.*
Etc.	*Etc.*

Point out that industrial development occurs around Gillette and Douglas. Also point out that mining projects occur along the interstate road to Sheridan. These facts should reinforce the relationship between site location and transportation facilities.

Using a road map or classroom wall map, have students draw main state and interstate roads in Wyoming on duplicated copies of these maps.

Have your students draw the major highways on the map of Montana. Locate and write in the names of towns near present and future sites of strip-mining. (Refer students to the map of Strippable Coal Reserves in Rocky Mountain States previously used in this lesson.)

> Note to Teacher: You may wish to show your students the maps of fuel-related projects scheduled for development in Wyoming and Montana (Maps 3 and 4). They show the location of present coal mines and include projected energy developments.

Extending the Learning

Have students research the population trends in their own county or state. What boom-bust communities developed there at one time? When and why did these conditions occur? Did any boom towns stablize their growth and remain thriving towns today? Why did these places continue to thrive, while others did not?

Have students select a growing city or town near where they live. Have them create a situation which might cause people to leave it, creating a ghost town. Then, have them make a plan for its revival.

What Factors Can Change Boom to Fizzle?

For students who enjoy working with statistics and projecting trends, give the following information and questions:

PROJECTED SURFACE COAL PRODUCTION
(million short tons)

State	1980	1985	1990	1995	2000
Montana	20	30	40	48	58
Wyoming	28	36	40	48	58

SULFUR CONTENT OF ESTIMATED STRIPPABLE RESERVES
(million short tons)

State	Low	Medium	High
Montana	6,133	764	0
Wyoming	13,377	65	529

Source: Rehabilitation Potential of Western Coal Lands: A Report to the Energy Project of the Ford Foundation, National Academy of Sciences, p 33 and p 27.

1. If coal stripping continues in Montana and Wyoming after the year 2000 at the same rate of 58 million short tons a year (as is projected through 2000), how long will coal strip-mining last in Wyoming? In Montana?
(~241 years in Wyoming, ~119 years in Montana.)

2. How can these figures support the belief that coal strip towns will not fizzle out?
(Statistics show the amount of coal in these two states, but they do not point out the amount of coal in specific mines near specific towns. The fact that there is a lot of coal is important. It can be presumed that in some cases people may have to travel greater distances to their jobs, however.)

3. Suppose the following factors emerge. How would each affect the growth of a boom town?

   a. Development of other energy sources.
   (May reduce the need for coal, retarding the growth of boom conditions.)

   b. An amendment to the Clean Air Act stating that scrubbers (anti-polluting devices) be applied to the burning of all coal in the United States. Note: Western coal is lower in sulfur and, therefore, produces lesser amounts of noxious sulfur dioxide when burned. The amount of western coal required for a heat yield of one million BTU's will also release about 0.7 pounds of sulfur dioxide -- which is well within the permissible standard for clean air at 12. pounds per million BTU's. Average eastern coal produces over three pounds of sulfur dioxide per million BTU's. Thus, expensive scrubbers required to bring underground eastern coal within the 1.2 pound sulfur standard would also have to be applied to the burning of western coal, which in fact can pass the environmental test without scrubbers.
   (May reduce the demand for western coal since the cost of scrubbers would increase the price of the coal.)

   c. Amount of water available for industrial and home use.
   (Insufficient water for home and industrial use would force coal workers to live in places other than the boom town, so growth in the area would be decentralized.)

   d. Government restrictions on methods of strip-mining and extent of land reclamation.
   (If mining methods or reclamation requirement costs run high, these would add to the price of coal and possibly reduce demand.)

3. Can a State Maintain Its Environmental Purity If It Becomes a Coal Producer?

Overview

How will western lands be used? Can ranchers, environmentalists, and miners resolve their differences over land use? Is confrontation inevitable? How many views are supported by facts? How many are mere rumor and prejudice? These questions were important in the 19th century as various groups of people with different economic interests settled in the West; and they are important again today as many Westerners find that coal companies want to buy their land.

The purpose of this lesson is to examine these opposing viewpoints and to analyze the quality of the arguments on both sides according to three criteria: 1) the dependence on emotional words; 2) the influence of ambiguous word use; and 3) the presence or absence of factual evidence. There has been no attempt to represent all the views of either side or to collect statements that would present either side from a single perspective.

This lesson can be used in an economics, social, or political issues class as well as in a 19th century history course when the westward expansion is studied.

Objectives

Students should be able to:

1. Identify some conflicting opinions underlying the controversy over strip-mining the open ranges of the Northern Great Plains.
2. Identify emotional words.
3. Identify ambiguous words.
4. Evaluate the quality of the evidence used in support of the two positions.

Target Audience Social Studies.

Time Allotment Two class periods.

Materials

Student Activity Sheet 1: "Opinions Chart," p 51
Student Activity Sheet 2: "Personal Statements," pp 52-57
Class copies of "Summary Exercise," pp 58-62

Optional material for teacher/student:

"Should They Build a Fence Around Montana?" National Geographic, May 1976.

For teachers interested in pursuing the language and evidence analysis in the second part of the lesson, the following three sources provide additional information:

1. Frankel, Jack and Carl Ubbelohde, (ed.), Values of the American Heritage, Washington, D.C.: National Council for the Social Studies 1976 Yearbook, pp 146-213.

2. Kurfman, Dana (ed.), Developing Decision-Making Skills, Washington, D.C.: National Council for the Social Studies 1977 Yearbook. Especially Chapters 1, 2, and 7.

3. Shaver, James and Guy Karkin, (ed.), The Analysis of Public Issues, Instructor's Manual, Boston: Houghton Mifflin, 1973.

Teaching Strategies One good way to begin to look at the present conflict over resources in the West is to use a series of photographs to illustrate the problems faced by the Montana ranchers. The best sources available at this time are in the May 1976 issue of National Geographic (Vol. 149, No. 5) in an article entitled, "Should They Build a Fence Around Montana?" and a photo essay, "Growing Up in Montana," by Mike Edwards and Nicholas DeVore III.

Ask questions that center around the feelings that the students have about using the land for strip-mining and how they think the ranchers might feel about letting their land be mined. After the general discussion, the class can progress to an investigation of the opinions of the participants in the problem. Teachers should try to obtain materials from energy industries in order to compare different points of view.

Developing the Lesson

First, discuss the opinions listed on the left side of the Opinions Chart (Student Activity Sheet 1, page 51) with the whole class. To personalize the problems that ranchers and coal producers have to deal with, tell students that they are to agree or disagree with each statement after it has been read aloud. We suggest that the teacher read the statements, one at a time. After reading the statements, ask whether or not all students have understood the statement. If all understand, then a vote is taken, either by hands or by secret ballot. The results can be posted on the board and compared with the opinions of the ranchers and coal producers in the Personal Statements (Student Activity Sheet 2, page 52).

After discussing the personal opinions of the class, give each student a copy of the Opinions Chart (Student Activity Sheet 1) and copies of the Personal Statements (Student Activity Sheet 2). For each of the personal statements, both ranchers' and coal producers', have students indicate whether the individual agreed, disagreed, or had no opinion about the statements on the Opinions Chart. The easiest way to keep track of the opinions is to write the number of the reading in the space provided as shown on page 23.

The students may fill in the Opinions Chart in either of two ways. Ask the students to indicate "No Opinion" when a statement does not deal with a specific opinion. For example, the first reading does not deal with the question of whether owning land is more important than having money. Students should indicate that #1 had no opinion on that issue. As an alternate strategy have students make a good estimate of the opinions of rancher #1 by reading the statement given and then choosing which opinions they think the person might have. Rancher #1, if asked, probably would indicate that land was more important than money. Thus, instead of putting "No Opinion," the students could decide what they think the individual might feel about each opinion.

Note: The following Opinions Chart is intended as a guide to the teacher only. It is not intended to contain the "correct" answers since individuals can offer different answers. The underlined numbers are those opinions which are clearly stated by the individual. Other numbers indicate probable opinions that could be expected from the individual.

Opinions Chart

OPINIONS	RANCHERS			COAL PRODUCERS		
	Agree	No Opinion	Dis-agree	Agree	No Opinion	Dis-agree
A. All people must share the burden of solving the national energy problem.	5,7	1,2,3, 4,6		8,10, 11	9,12	
B. People should not be forced to do something they do not wish to do.	1,2, 3,4,6, 7	5		8,1	12	10,11
C. Large corporations lie, cheat, and steal if it is in their best interests.	1,3, 6	2,4,7	5		10	8,9, 11,12
D. Scientists can solve almost any problem which faces our nation.	5	1,2,3 4,6,7		11, 12	8,9, 10	
E. All land must be protected and kept in its natural state.	1,2, 6	3,4,7	5			8,9, 10,11 12
F. A small group of people shouldn't be able to stand in the way of progress.	5	2	1,3, 4,6, 7	8,9, 10,11 12		
G. Land ownership is more important than having money.	1,2, 4,6, 7	3	5		9,10, 11,12	8
H. Land is not equal. Some land is more beautiful than other land.	6	3,5, 7			8,9, 10,11, 12	
I. Land gives a person a history, a past. You should never leave your land.	1,2, 4,6	3,5, 7			9,10, 11,12	8

Summary Exercise

1. List the letter of the five opinions with which the ranchers and coal producers most frequently agree or disagree.

RANCHERS		COAL PRODUCERS	
Agree	Disagree	Agree	Disagree
B	*A*	*A*	*C*
G	*D*	*D*	*E*
I		*F*	

2. Which opinions held by ranchers and coal producers today would have been held by these groups during the first westward expansion of the 19th century?

RANCHERS	COAL PRODUCERS
(Possibly B,C,E, G,H,I.)	*(C,E.)*

3. What opinions have probably changed since then? *(A, D, possibly F.)*

Analysis of Arguments

1. Review the ranchers' and coal producers' opinions. Does one group have a superior argument? Why or why not? *(Answers will vary.)*

We have all made statements like those of the ranchers and coal producers. War, welfare, territorial possessions, the death sentence, busing, arguments with parents and friends - all produce strong feelings. Often, we are overprotective of our opinions. We try to impose them on others and in the end learn very little and seldom convince others that we are correct. Let's reexamine the ranchers' and coal producers' opinions in light of three factors we need to keep in mind when arguing about anything. These are:

a. The Emotional Appeal of Words
b. The Ambiguity and Bias of Words
c. Factual Evidence

a. The Emotional Appeal of Words

Words can have both a descriptive meaning (the dictionary meaning) and an emotional meaning based on positive or negative feelings aroused by the use of these words. For example, "pencil," "chair," or "glass" probably have only descriptive meanings, but "coal," "strip-mining," and "boom towns" have not only descriptive meanings, but emotional connotations as well which produce a variety of negative or positive feelings depending on one's past experience. People use emotional words to sway others to accept their point of view.

1. Reread the rancher and coal producer arguments, select four emotional phrases and then complete the chart below:

	Number of the Statement	Emotional Word or Phrase	Emotional Connotations
Examples:	*1*	*Steal the country blind*	*Coal companies are acting unethically, taking advantage of the country's needs.*
	4	*To sell out*	*To give up, a betrayal; to trade something valuable (one's heritage) for something less valuable (money).*
	10	*Shut down their refrigerators*	*Take away the necessities of life.*
	11	*Hand-wringing*	*Overly dramatic - emotional, frustrated, panicky.*

2. Try rewriting Speaker 3's argument, eliminating all the emotional words and using only descriptive words. What's the effect? *(The statement is flat. One possibility is: "We feel that mining companies do not tell the truth. Their reports often differ from what we believe to be the truth. Their interpretation of a lease differs from our understanding.")*

b. The Ambiguity and Bias of Words

We know that words have both descriptive and emotional meanings. Words can also be ambiguous and biased. An ambiguous phrase is not specific enough to be understood out of context. Words used to communicate personal feelings which are not necessarily part of a general outlook on life show the speaker's bias, his/her opinion.

Go through the rancher and coal producer arguments looking for words or phrases that are ambiguous and/or biased. Write these in the chart below. *(Here are a few examples.)*

Words or Phrases With Unclear Meanings	Why Ambiguous or Biased
Land is the cream of the country (Speaker 6)	*This judgment is relative. Some may think land is useless.*
To spread the burden (Speaker 7)	*The burden is not defined, nor is the extent of the problem explored.*
Country needs it (coal) (Speaker 10)	*The extent of the need is not clear. The speaker could be exaggerating.*

(NOTE: Be sure to point out the differences among emotionality, ambiguity and bias.)

c. Factual Evidence

Finally, consider how much factual evidence the ranchers and coal producers used in supporting their opinions. People like to say their opinions are based on facts, not merely on their feelings.

1. Complete this chart by listing the facts in each speaker's opinion.

Speaker	Facts
1	-nonrenewable resource for manufacturing electricity and such
2	-none
3	-none
4	-none
5	-we can send people to the moon -coal development will certainly mess up the land -and some damage will be irreparable
6	-we've been born and raised in the cow business
7	-he says he wants to spread the burden as equally as possible among the people in the country
8	-I sure did have many personal doubts -I have had no qualms about that -I have no problems about whether coal should be strip-mined
9	-there are ranches for sale that they can buy
10	-federal coal belongs to all U.S. citizens -the country needs it
11	-these times of energy shortages and economic decline
12	-some old-time strip-mining operations scarred the landscape -typical proposed mining site is a prairie -subsoil and topsoil are carefully saved for that purpose

2. Analyze the value of each fact by using the questions below.

   a. Is the source of the information firsthand, common knowledge, or hearsay?

   b. Does the source support or weaken the fact?

   c. Can the fact be supported by further research?

   d. Do you think the source of the information influences the speaker's credibility? How?

(Answers will vary. Part d is an opinion question.)

3. Now go back to the first question (in the Summary Exercise) in which you explained whether or not the ranchers or the coal producers had the superior argument. Did you change your opinion? *(Answers will vary. Students will see that statements use emotional, ambiguous and biased words and phrases, and only those facts that support their opinions.)*

Sources for Quotes

(For complete citations see References.)

Ranchers

1. Gold, A Comparative Study, p 173
2. Ibid, p 161
3. Ibid, p 49
4. Ibid, p 46
5. Ibid, p 45
6. Charter, p C4
7. Gold, "Toward Social Policy," p 6

Coal Producers

8. Johnson, p C5
9. Gold, A Comparative Study, p 77
10. Edwards, p 646
11. Johnson, p C5
12. The Washington Post, July 13, 1977

References

Bass, Thomas. "Moving Gary, Indiana to the Great Plains." Mother Jones, July, 1976.

Charter, Boyd. "When We Die America Dies." The Washington Post, August 3, 1975.

1978-79 Coal Facts. National Coal Association, 1130 17th Street, N.W., Washington, D.C. 20036.

Edwards, Mike and Nicholas DeVore III. "Should They Build a Fence Around Montana?" National Geographic 149 no. 5, May 1976.

Gold, Raymond L. A Comparative Study of the Impact of Coal Development on the Way of Life of People in the Coal Areas of Eastern Montana and Northeastern Wyoming. Institute for Social Science Research, University of Montana: Missoula, Montana, 1978.

Hine, Robert V. The American West: An Interpretive History. Little, Brown and Company: Boston, 1973.

Johnson, Haynes. "The Last Roundup." The Washington Post, August 3, 1975.

McCarthy, Colman. "Western Coal: Whose Boom?" The Washington Post, April 24, 1976.

Papers Presented Before the Second Symposium on Coal Management Techniques, October 19-21, 1976. National Coal Association, 1130 17th Street, N.W., Washington, D.C. 20036. Price $8,00.

4. What Happens When There Is Coal on Your Doorstep?

Overview

When hundreds, perhaps thousands of people start moving into a sleepy rural town, what's going to happen to the old residents' way of life? Are the newcomers better or worse off for their relocation? What kinds of institutions will be affected? As someone said, "Many people come to boom towns dreaming of instant wealth; few leave without scars of their experience."

Objectives

Students should be able to:

1. List the major physical problems a boom town faces in delivering goods and services.
2. List some human problems of living in a boom town.
3. Answer map questions about living conditions in a boom town.

Target Audience

American History, Physical-Cultural Geography, Political, Social or Economic Issues.

Time Allotment

Two class periods. (One-two weeks, if research activity is included.)

Materials

Map: "Town of Kenville," p 63
Student Activity Sheet: "What Happens When There is Coal on Your Doorstep?", pp 64-66
Selected Readings and Student Activities, pp 67-73

Optional materials for students/teachers:

1. "Should They Build a Fence Around Montana?" National Geographic, May 1976.
2. "The New Hunger for Coal Brings a Boom to Wyoming's Sweetwater County," Smithsonian, July 1974.
3. "A Second Coal Age Promises to Slow Our Dependence on Imported Oil," Smithsonian, August 1977.

Teaching Strategies

Begin by discussing life in boom towns of the 19th century in America. There are good accounts in most history texts and all of these include pictures. Have your students infer standards of living, populations (how many and what kinds of people lived in these towns), distinctive reasons for the rise of these cities, etc. from pictures and short readings.

Part 1

Distribute copies of the student materials in this lesson. Have students look carefully at the map of the imaginary town of Kenville, and answer each question. At an appropriate time during the class period, discuss each

Part 2

answer. Then have students turn to the set of Selected Readings and identify the influences of boom town living conditions on people's lives. These influences should be classified under appropriate headings. As time permits, discuss the ways in which people cope with change.

Extending the Lesson

For students interested in further research of a particular boom town they have read about in this lesson, or in the past, the following questions might be helpful. (Note: You may wish to make this research assignment a general one. The outcome can take the form of a research paper.)

Choose one town or city that you have once visited or lived in that you want to know more about, and do an in-depth study. Deal with these topics:

A. What special resources caused the city's growth (for example, railroads or the discovery of oil or coal)? Did the city have a boom period of growth?

B. Make a map of the central city and its suburbs.

C. Make a table showing the population of the city. Show how the population has been growing (or shrinking) on a line graph. What are some reasons?

D. Does the city have established ethnic neighborhoods (Chinese, Native American, etc.)? How did these neighborhoods get started? Can you show these on your map?

E. Do some industries dominate the city? Are jobs in these industries growing? Have national circumstances aided or changed the growth patterns in one particular industry in the city?

F. What forms of transportation serve the city?

G. What cultural advantages does the city offer?
   1. Museums, theatres, orchestras, art galleries?
   2. Colleges and universities?

H. What has been done to improve the quality of life for the people living in the central part of the city?

I. List the books or other sources you used to get the information you needed.

Student Activity

What Happens When There is Coal on Your Doorstep?

Part 1

When hundreds of new families start moving into a sleepy rural town, what's in store for the town's former way of life? What compromises will new families have to make? Can facilities like sewers and water handle the new growth? These are some important questions that call for urgent answers in any boom town.

Imagine that you are a reporter for the school paper assigned to take a set of slides to a council meeting in support of a series of articles you have written under the title: STUDENTS SPEAK OUT.

At the town council meeting present your handmade map of the town. Give your talk as if each member of the council were answering your questions about the map of Kenville. Write the responses you think the council members will make.

1. You and your family have just moved into Kenville. Where will you probably have to go to find a place to live for a couple of months? *(The temporary trailers located in the northeast section of town.)*

2. Then after a few months, where will you be most likely to move to? Why?
(The permanent trailer courts in the south part of town because permanent housing probably won't be available or desirable.)

3. You earn good money - $75.00 to $90.00 a day. Even with saving a lot each month, why won't you be able to buy your own home for many years?
(Lack of permanent housing in Kenville; construction workers will move on.)

4. Which of the following facilities in the town might be stretched beyond their capacity to offer good reliable services in a year or two? (Use a check mark.)

_____ Tenley Memorial Hospital (24 beds)
_____ Public schools
_____ Parks and recreation centers
_____ Town water pipes and sewer lines
_____ Wells and water supply system
_____ Shopping places
_____ Police and fire protection
_____ Single-family homes or apartments
_____ Specialists: doctors, dentists, lawyers, teachers, librarians, tradespeople

(None is adequate.)

What others can you think of? Write them in the space below. Remember to use the map in making your choices. *(Student answers will vary.)*

5. In your opinion, why doesn't the housing pattern in Kenville show a proper balance? *(Only residents of permanent housing have direct access to park area; the number of trailer homes far exceeds the number of permanent homes; permanent housing and trailer housing could be more balanced if the public land were used for permanent housing, but no decision has been made.)*

6. Look carefully at the map. What might two complaints be from young people in Kenville? *(There is no movie or playing field.)*

7. Oldtimers in Kenville don't want anyone telling them what they can do with their land. List some of the other fears older residents might have about the big mining project. List them under headings:

Environment	*(Noise pollution, traffic congestion, railroad traffic, air pollution, ugly view of strip mining.)*
Economy	*(Higher taxes for more services.)*
Social Change	*(Too many people, too crowded, too much crime, less stable community.)*

Part 2

1. Turn now to the Selected Readings. After you finish each, write the problem that the reading highlights. Use the headings:

Personal Problems	Public/Social Problems
(Alcoholism, drug abuse, depression, marriage problems, child neglect and abuse, fights, weak family ties, long working hours, constant movement.)	*(Health care services are poor, schools are inadequate, little permanent, overcrowding, few recreational facilities, long working hours, constant movement.)*

2. The readings illustrate the fact that boom towns face many challenges. If you were the town director of development in a western village that lies near a large new mining project, what problem would you want to solve first? What would you do?
(Student answers will vary.)

3. Think back to the people described in the readings. Then, acting in your capacity as director of development, how would you help these newcomers develop a sense of belonging? List your ideas.
(Student answers will vary.)

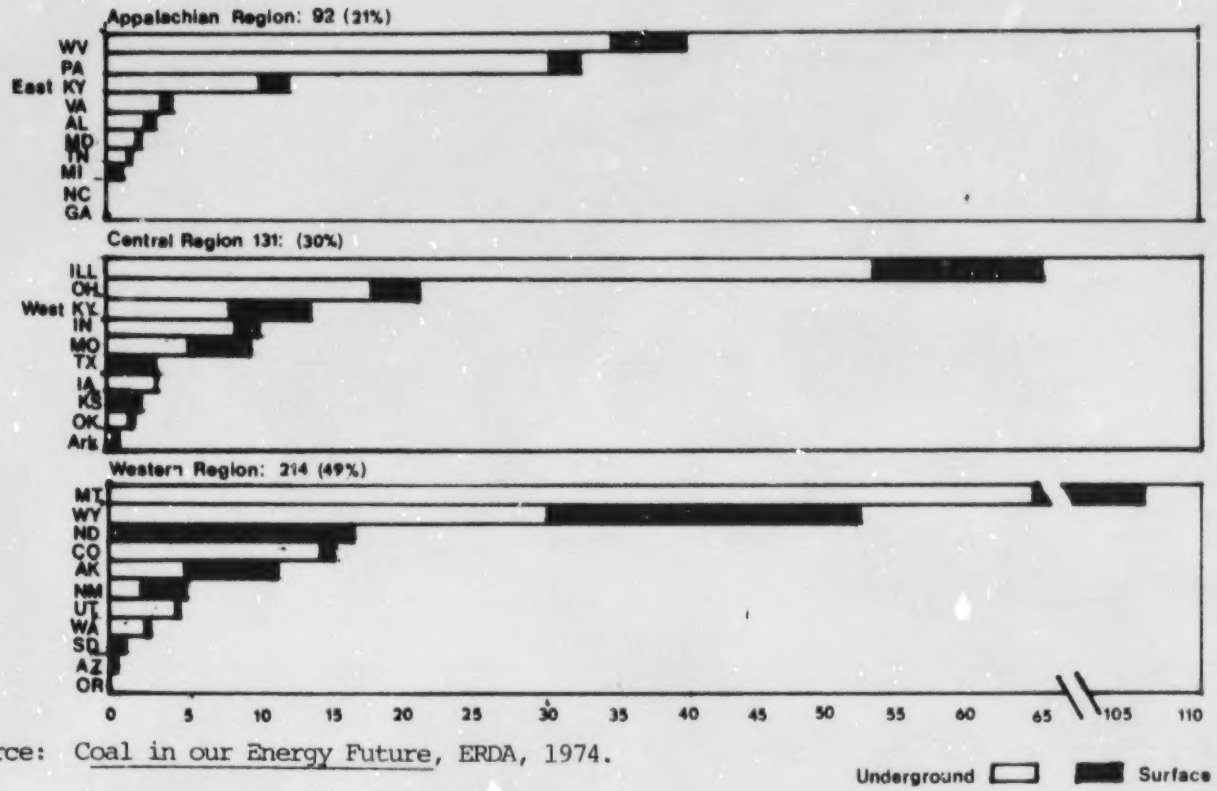
Part 3

Take part in the research/report project on alternatives to the boom town syndrome found at the end of the Selected Readings.

Student Guide

Lesson 1
Table

LOCATION OF U.S. COAL RESERVES
(Billion Tons)

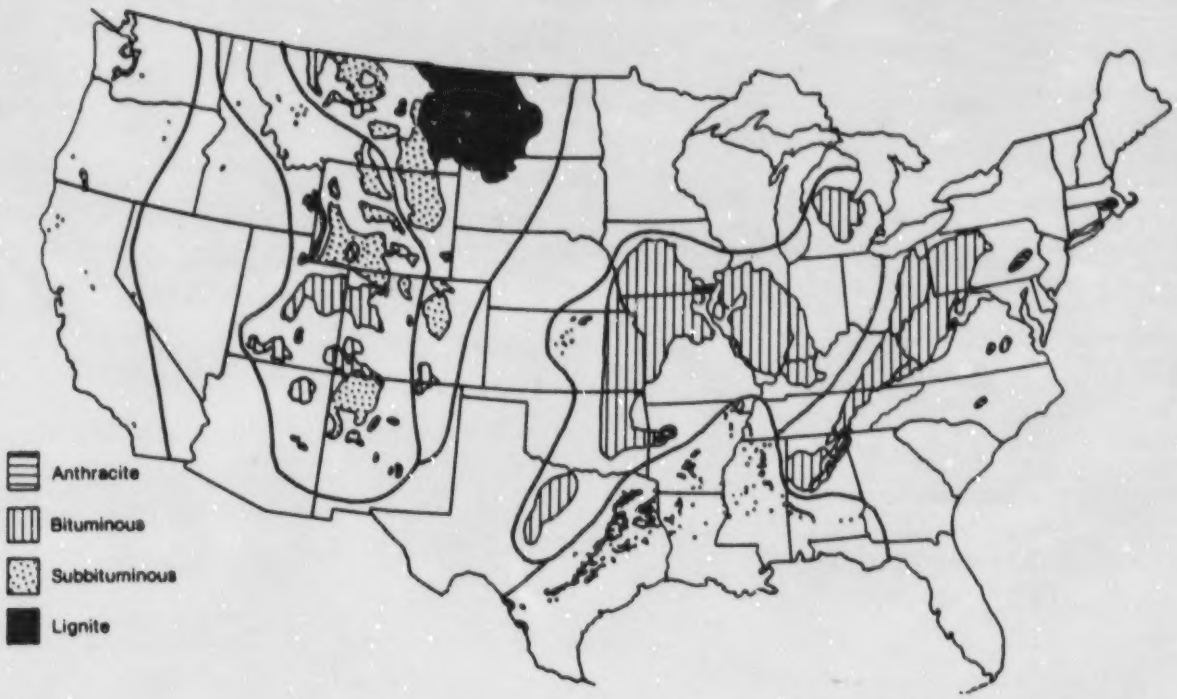


Source: Coal in our Energy Future, ERDA, 1974.

Includes coals in identified deposits, in relatively thick beds, and minable by conventional methods, as of January 1, 1974, according to U.S. Department of Interior, Bureau of Mines.

Lesson 1
Map

DISTRIBUTION OF UNITED STATES COAL RESOURCES



Source: Bureau of Land Management, Draft Environmental Impact Statement: Proposed Federal Coal Leasing Program (1974).

Anthracite coal- a hard coal that differs from bituminous in that it contains less volatile material and usually has the most heat potential of the four types of coal listed here.

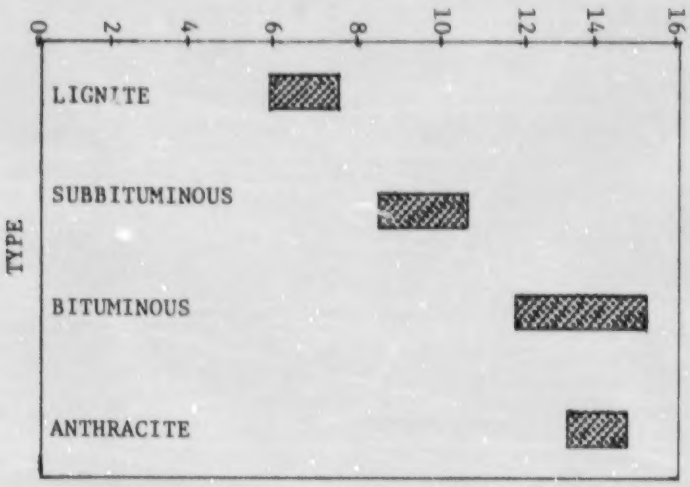
Bituminous coal- comparatively hard coal, with roughly the same heat potential as anthracite.

Subbituminous coal- not as hard as bituminous coal and with less heat potential.

Lignite coal- the softest of the four types of coal listed, with the least heat content.

Lesson 1
Graph 1

HEAT CONTENT OF MAJOR COAL TYPES
(in thousands of BTU's per pound)



Source: Energy Alternatives, A Comparative Analysis, Figure 1-3, Environmental Policy Center, 317 Pennsylvania Avenue, S.E., Washington, D.C. 20003, February 1975.

1. What does this graph show?

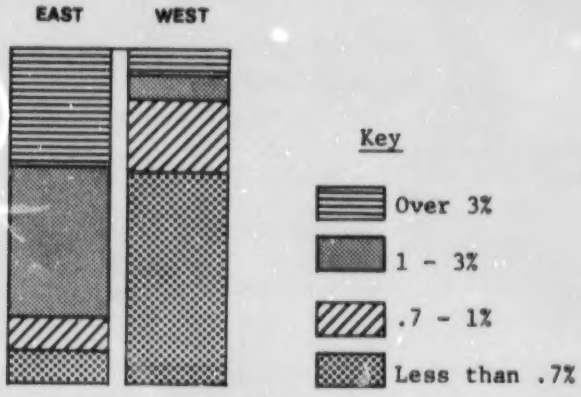
2. Finish this sentence: The greater number of BTU's, the _____ _____.

3. Looking only at this graph, why might utility operators wish to buy anthracite or bituminous coal instead of subbituminous or lignite?

4. Yet subbituminous coal is much in demand today. What could be one reason? Can you think of others?

Lesson 1
Graph 2

SULFUR CONTENT OF EASTERN AND WESTERN COAL



Source: Fortune, May 1974, p 216.

1. What does this graph show?

2. According to the graph, does all coal contain sulfur?

3. Which region of the U.S. has large quantities of low sulfur coal?

Lesson 1
Student Activity Sheet

You decide. Read the following situation carefully, then pick the coal you would buy and give your reasons. Write these on your own paper.

Suppose you have been hired as an executive for an electric power plant which uses coal burning boilers. The plant is located in a southwest suburb of Chicago, Illinois.

It is your job to buy coal for the boilers. You can purchase coal from one or two sources, both of which are competing to get a one year contract from you. They will deliver the amount of coal you need, when you need it. Both live up to the slogan: YOU CALL; WE HAUL.

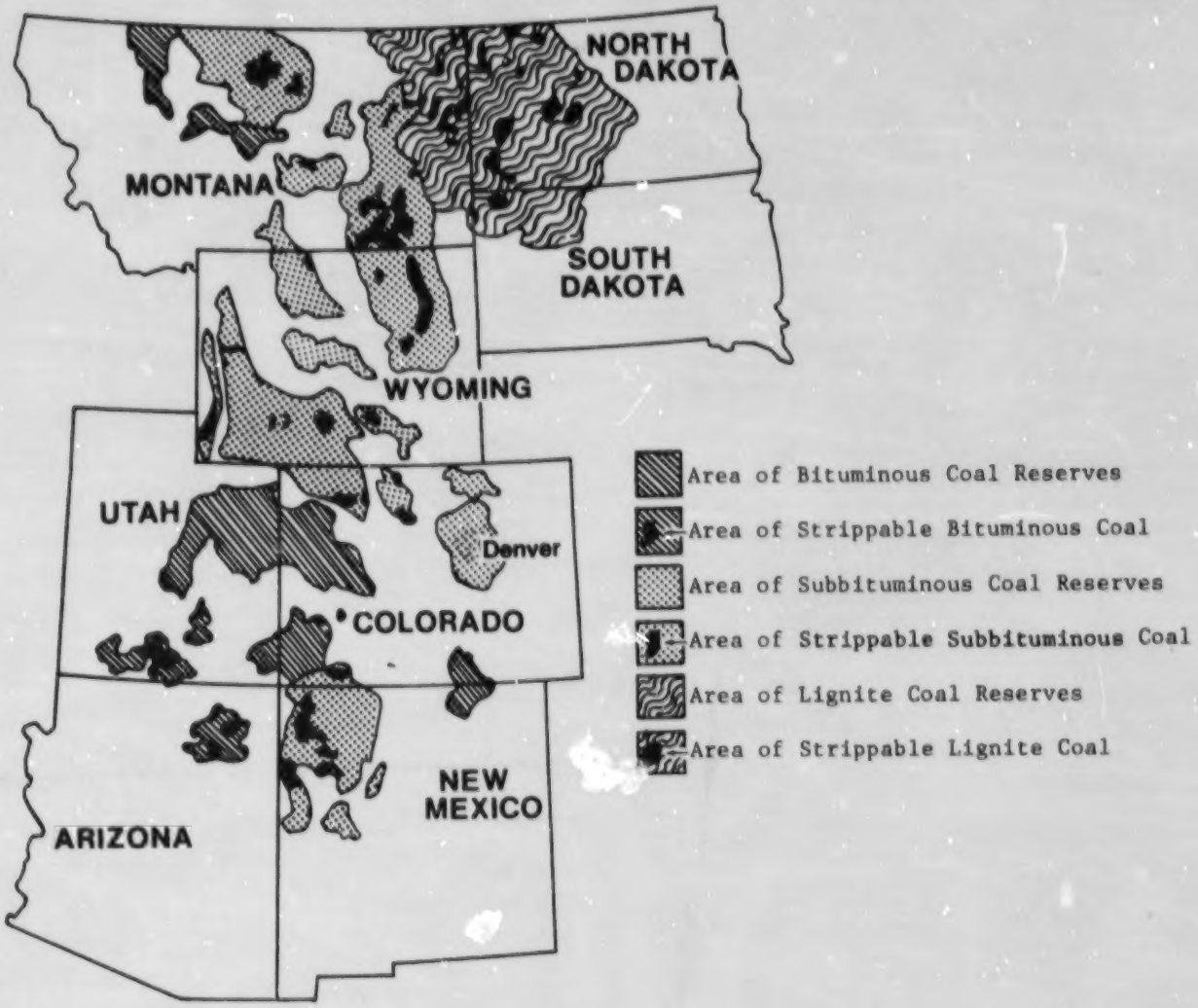
Your job is to select the most economical coal for your company. Which will it be?

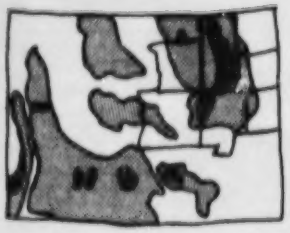
Available Data:

	Montana	West Virginia
Average Selling Price	$9.00/ton	$27.00/ton
Distance to Utility	1,270 miles	360 miles
Transportation Costs Per Ton Mile	$.01/ton mile	$.02/ton mile
Heat Content in BTU/ton	18 million BTU/ton	26 million BTU/ton
Antipollution Devices	None	$.50/million BTU's

Lesson 2
Map 1

STRIPPABLE COAL RESERVES IN ROCKY MOUNTAIN STATES

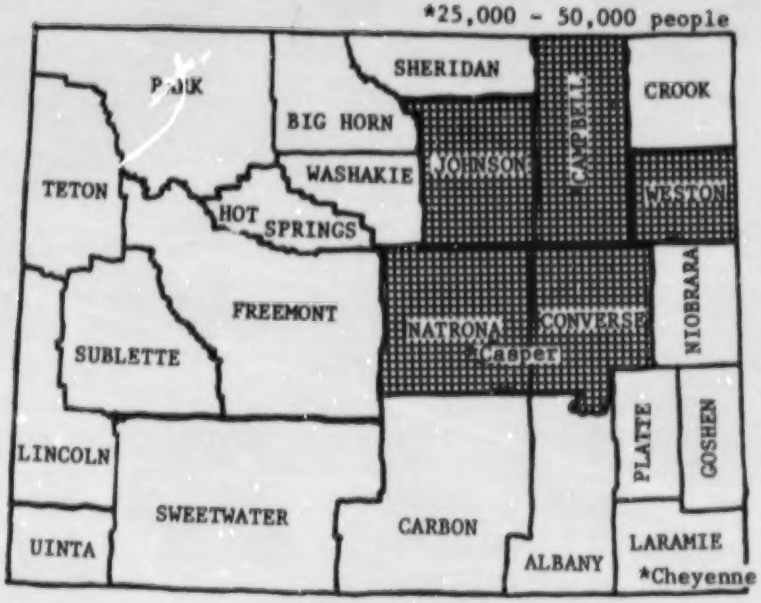




WYOMING

Area of Subbituminous Coal Reserves

Area of Strippable Subbituminous Coal



PRESENT AND FUTURE EMPLOYMENT NEEDS
FOR FIVE COUNTIES IN WYOMING

CAMPBELL COUNTY	1960 Census	1970 Census	1980	1985	2000
Population	5,861	12,957	23,330	30,310	50,400
Industrial Sectors					
Agriculture	670	601	550	540	500
Petrochemicals					
Petroleum and Natural Gas	224	1,364	1,300	1,380	1,370
Synthetic Gas	--	--	--	640	2,560
Coal Mining	32	32	930	1,740	2,390
Uranium Mining and Milling	2	--	150	250	210
Power Generation	--	40	70	70	180
Other Mining	--	--	--	--	--
Other Manufacturing	18	131	140	150	230
Railroads	22	11	80	90	90
Construction	189	268	1,690	2,010	1,780
Other Residentiaries	1,120	2,356	4,880	7,260	12,860
Total Employment	2,277	4,803	9,790	13,630	22,170

JOHNSON COUNTY	1960 Census	1970 Census	1980	1985	2000
Population	5,475	5,587	7,470	8,730	14,350
Industrial Sectors					
Agriculture	549	410	380	370	340
Petrochemicals					
Petroluem and Natural Gas	146	101	100	100	100
Synthetic Gas	--	--	--	--	640
Coal Mining	--	34	--	--	190
Uranium Mining and Milling	3	--	250	250	210
Power Generation	--	--	--	--	--
Other Mining	2	19	30	30	40
Other Manufacturing	63	44	50	60	80
Railroads	--	--	--	--	--
Construction	235	294	290	790	520
Other Residentiaries	968	1,300	1,890	2,070	4,040
Total Employment	1,966	2,202	2,990	3,670	6,160

CONVERSE COUNTY	1960 Census	1970 Census	1980	1985	2000
Population	6,366	5,938	15,490	17,760	18,510
Industrial Sectors					
Agriculture	580	486	450	440	400
Petrochemicals					
Petroleum and Natural Gas	177	204	190	200	200
Synthetic Gas	--	--	640	640	640
Coal Mining	17	39	60	210	210
Uranium Mining and Milling	30	71	570	770	640
Power Generation	25	--	190	190	190
Other Mining	--	--	--	--	--
Other Manufacturing	16	16	20	20	30
Railroads	25	6	110	140	250
Construction	192	225	650	600	620
Other Residentiaries	1,345	1,121	3,470	4,240	4,590
Total Employment	2,407	2,168	6,350	7,450	7,770

NATRONA COUNTY	1960 Census	1970 Census	1980	1985	2000
Population	49,623	51,264	56,580	59,370	63,270
Industrial Sectors					
Agriculture	558	483	450	430	400
Petrochemicals					
Petroleum and Natural Gas	3,745	2,906	2,770	2,930	2,930
Synthetic Gas	--	--	--	--	--
Coal Mining	--	--	--	--	--
Uranium Mining and Milling	64	501	500	500	410
Power Generation	78	106	30	30	40
Other Mining	10	17	30	30	40
Other Manufacturing	523	460	520	570	820
Railroads	255	145	110	110	110
Construction	1,845	1,545	1,900	2,240	2,310
Other Residentiaries	11,943	14,233	16,320	18,080	20,130
Total Employment	19,021	20,396	22,630	24,920	27,190

WESTON COUNTY	1960 Census	1970 Census	1980	1985	2000
Population	7,929	6,307	6,270	6,540	6,580
Industrial Sectors					
Agriculture	362	227	210	210	190
Petrochemicals					
Petroleum and Natural Gas	509	394	380	400	400
Synthetic Gas	--	--	--	--	--
Coal Mining	--	--	--	--	--
Uranium Mining and Milling	--	--	--	--	--
Power Generation	60	45	30	30	--
Other Mining	40	100	150	170	230
Other Manufacturing	120	9	10	10	20
Railroads	10	18	10	10	10
Construction	267	146	150	170	180
Other Residentiaries	1,526	1,345	1,350	1,450	1,470
Total Employment	2,894	2,284	2,290	2,430	2,500

Source: Energy Resources Development in Wyoming's Powder River Basin
Northern Great Plains Resources Program
pp 81, 86, 91, 103, 110.

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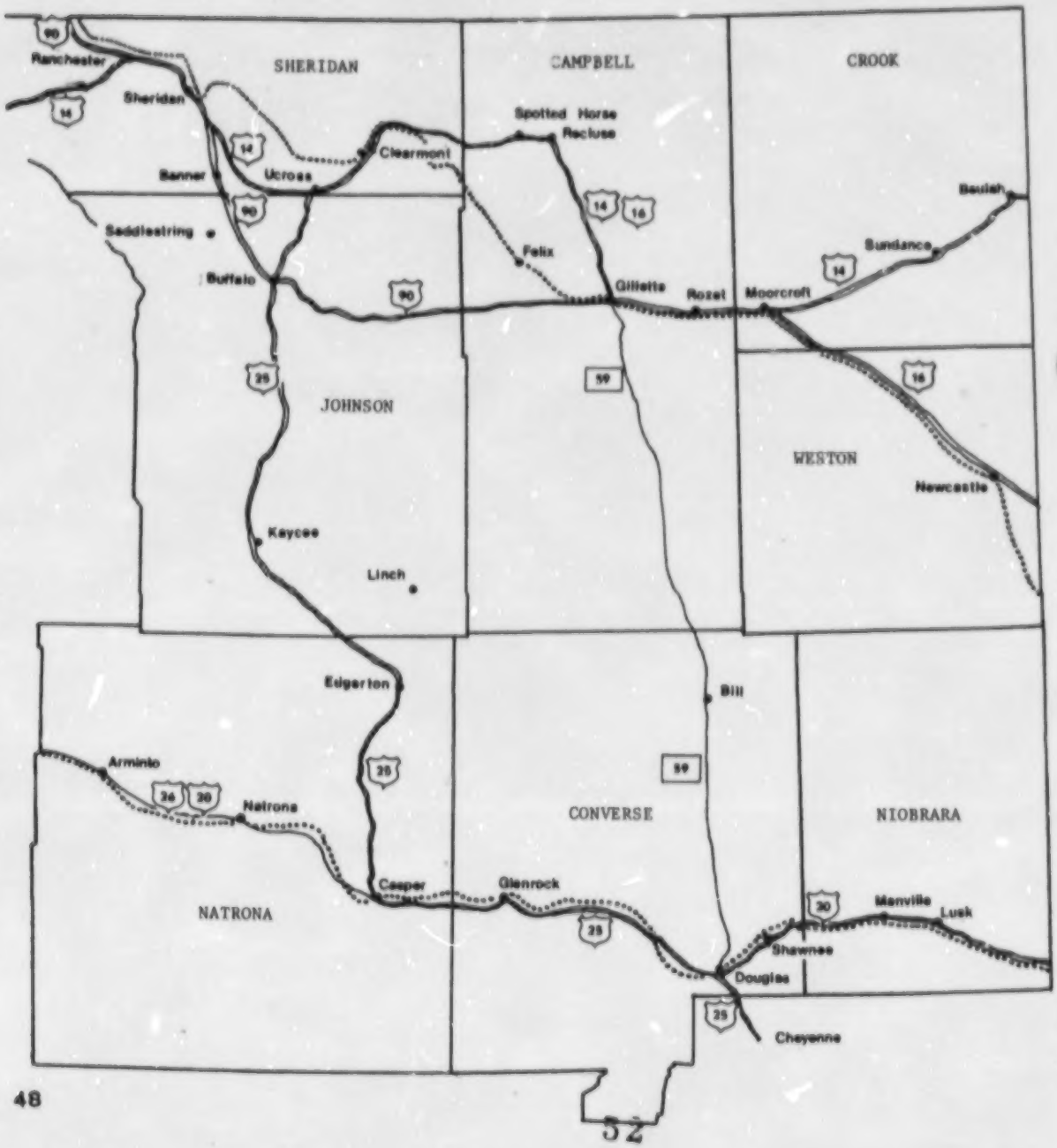
Lesson 2
Map 2

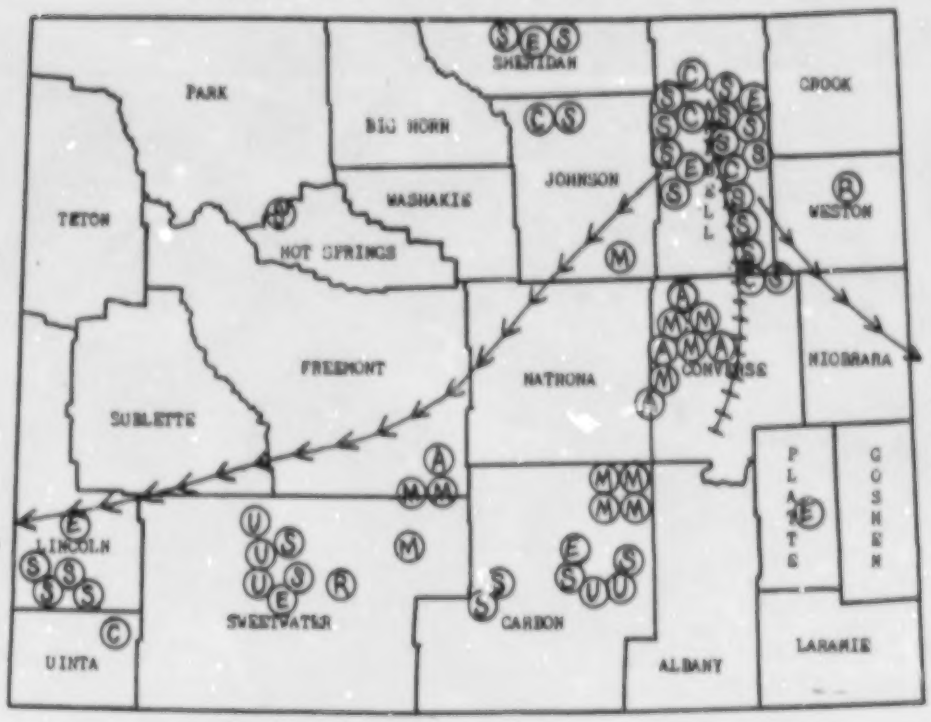
Interstate Highway
State Road
Railroad

NORTHEASTERN WYOMING TOWNS
AND TRANSPORTATION NETWORK



Lesson 2
Map 3

FUTURE FUELS-RELATED PROJECTS IN WYOMING



LEGEND

- (S) Strip coal mine
- (U) Underground coal mine
- (E) Electric power plant
- (C) Coal conversion plant
- (M) Uranium mine
- (A) Uranium mill
- (R) Oil refinery or natural gas processing plant
- +++ Railroad
- ⟶ Coal slurry pipeline

Lesson 2
Map 4

FUTURE FUELS-RELATED PROJECTS IN MONTANA

LEGEND

(S) Strip coal mine

(E) Electric power plant

(C) Coal conversion plant

⟶ Coal slurry pipeline

Lesson 3

Opinions Chart

Directions: Decide if each rancher or coal producer would agree, disagree, or have no opinion of the following opinions based on your reading of their statements. Place the statement number in the corresponding boxes below.

OPINIONS	RANCHERS			COAL PRODUCTION		
	Agree	No Opinion	Dis-agree	Agree	No Opinion	Dis-agree
A. All people must share the burden of solving the national energy problem.						
B. People should not be forced to do something they do not wish to do.						
C. Large corporations lie, cheat, and steal if it is in their best interests.						
D. Scientists can solve almost any problem which faces our nation.						
E. All land must be protected and kept in its natural state.						
F. A small group of people shouldn't be able to stand in the way of progress.						
G. Land ownership is more important than having money.						
H. Land is not equal. Some land is more beautiful than other land.						
I. Land gives a person a history, a past. You should never leave your land.						

Lesson 3
Personal Statements

CAN A STATE MAINTAIN ITS ENVIRONMENTAL PURITY IF IT BECOMES A COAL PRODUCER?

Conflicts between groups of people during the settlement of the American West is a part of the established history of the region. In any area where two or more groups of people value different resources, and where the use of one resource by one group may prevent the use of another resource by a second group, conflicts will arise.

In the American West of the 19th century, several conflicts were important enough to be mentioned in history books. One of the most famous conflicts involved farmers and cattlemen. The clash usually involved the farmers' attempts to fence in the "open range" that the cattlemen looked upon as their own.

Another, more violent conflict involved the use of the same resource, the open range, by two different groups, the cattlemen and the sheepmen. From the cattlemen's viewpoint, sheep would ruin the range by cropping the grass so short that the cattle couldn't use it. Since cattlemen considered the open range their preserve, they often justified their violent attacks on the sheepmen as protecting their land. One of the worst of the attacks came along the Green River, in Wyoming, where 8000 sheep were clubbed to death after their keepers had been tied up by masked men. The war between the cattlemen and the sheepmen raged for years, accounting for at least twenty deaths and hundreds of injuries on the Wyoming-Colorado range alone.

A lesser known and less violent conflict which developed in the first westward expansion, involved the miners and farmers. When the gold rush first hit the West in California, the few farmers living in the territory were unprepared to feed the influx of people who came to make their fortune. At first, fortunes were made in transporting food from the East and selling it at inflated prices to the mining communities. But soon the former Mexican cattle ranches in southern California expanded under American ownership to feed the newcomers.

Although they profitted by the presence of the miners, the farmers and ranchers disliked the miners' treatment of the land and other natural resources. Miners in their haste had turned over mountains of earth and disturbed the plant life and ground cover of whole watersheds. Thus even minor rainfalls became floods on the farms below - floods of mud, not just water. The miners' hydraulic methods, using high-pressure jets of water to break down gold-bearing ledges and even whole hills, kept streams turbid, whether rains were heavy or not. Farmers in the valleys below were plagued with clogged irrigation systems, flooded crops, and polluted drinking water as a result. Although some state legislatures put limits on these practices, much irreversible damage was done.

Today's westward expansion once again involves a clash over the use of resources. Today, the search is for coal, instead of gold. The setting is primarily in the Northern Great Plains of Montana and Wyoming, though the potential for conflict exists in other western states as well. The coal resources are both rich and economically exploitable. For the last several years, the major coal and energy companies have been attempting to obtain permission to strip-mine the coal in these states. To do so, they usually must buy or lease the land from people who have lived in the area for generations, and who often resist selling.

Directions

The numbered statements that follow express some of the major concerns regarding mining. Read each carefully and fill in the chart. Then complete the other activities in the lesson.

RANCHERS

1. "The coal companies are using the present national energy crisis as an excuse to rip up our land in order to rip off the country's coal. There is no good excuse for that kind of destruction and larceny - yes, larceny, because they are about to steal the country blind while making everybody think they are some kind of heroes. And while they foolishly use up this nonrenewable resource for manufacturing electricity and such, they will destroy the productivity of our land for God knows how many decades."

2. "The very best that industrialization can offer is some extra money, which is too bad because, for people like me, land guarantees happiness, dollars don't."

3. "Mining companies make fools of us. They always lie about what they're intending to do, and how much of it they intend to do. They are sneaky, deceptive, and so on. They get you to sign (leases) through lying, and then it's too late to get a fair deal."

4. "If you sell out, then what will you do? You will no longer have roots and you will do and be nothing."

5. "If we can send people to the moon we can figure out how to reclaim the land. We could improve it by putting coal money into levelling and irrigating it. In the long run, coal development is good for the land. In the short run, coal development will certainly mess up the land, and some damage will be irreparable, but we should be able to live with it."

6. "The one thing that's harder to take than losing our land is losing our way of life... Like numerous others, we've been born and raised in the cow business...No matter what anybody says, a rancher works pretty hard. I don't think there's anybody in the world more independent than ranchers; we don't want a dole (welfare) and don't want somebody to look after us - and we don't want anybody telling us what to do either. That's what the coal companies are doing - coming in and telling us to get out."

"The coal companies say, 'Oh, this Montana is not any good.' Well, when we get right down to it, when we talk about range country, it's the cream of the country. We've had people come in here and say, 'Oh, well, what difference does it make if they tear it up? That country there isn't any good anyway.' But this country is as good as any country there is under the North American skies."

7. "If the President's energy policy is to be truly equitable, and he says he wants to spread the burden as equally as possible among the people in the country, then he should take care not to burden rural people more than other people... If urban people want the electricity, then they should have it, all of it, and the problems too...Policy should be made which keeps the democratic system of government above all else. This cannot be done by sacrificing any group of people or any region of the country. The end never justifies the means."

COAL PRODUCERS

8. The president of a coal company, who moved West from the East coast declared:
"We've had a very volatile situation with (the ranchers). But I think we're beginning to be able to accept each other, at least some of us. I think the ranchers, at least in our area, are beginning to believe - and many of them are believers - that the land reclamation can be completed. And in a way they don't believe possible."

"Did I ever have any personal doubts as to whether we were doing the right thing? My answer to you is yes, I sure did have many personal doubts...(But) there was never a doubt in my mind that coal should be mined as part of helping to solve the energy crisis. I have had no qualms about that. I have no problems about whether coal should be strip-mined. I believe (the land) can be replanted. What I had a problem with was...is it proper to take a man's land away from him, or, in effect, to drive him away? I'd like to think we didn't do that, but we sure interrupted some people's lives. And is this right?"

9. A woman whose parents were ranchers and whose husband works for the power company said:
"The ranchers here don't tell both sides. You'd think MPC (the Montana Power Company) was stealing their land when they're really getting a lot of money for it...I know from my work experience around the state that there are ranches for sale that they can buy."

10. Much of the coal, while located under property owned by private individuals or corporations, is owned by the federal government. An official of the Bureau of Land Management in Washington, D.C. stated:
"Federal coal belongs to all U.S. citizens, and the fact is, the country needs it. Are people in Chicago going to shut down their refrigerators so people in Montana can have uninterrupted vistas? What is that going to cost the nation? We'll do the best we can to minimize the impacts, but the trade-offs have still got to be made."

11. The president of the power company said: "In these times of energy shortages and economic decline, coal-related development well might be welcomed with applause rather than hand-wringing...Intelligent use of western coal is absolutely neccessary if this nation is to approach anything like energy self-sufficiency. We in Montana will not accept (becoming) a national sacrifice area, but we are ready to use our resources for the benefit of our nation's economy and security. We are convinced that can and will be accomplished without destroying ourselves and our land."

12. From an advertisement by an energy corporation: "Granted, some old-time strip-mining operations scarred the landscape. But, we suspect that few among the (Washington energy policy makers) have ever seen a <u>modern</u> surface-mining operation or the specific <u>western</u> areas being contemplated for mining. They visualize redwood forests ravaged or beautiful mountain areas raped by machine. Actually, the typical proposed mining site is a prairie; and the typical modern surface-mining operation guarantees to restore that prairie to virtually its original state, a section at a time. Subsoil and topsoil are carefully saved for that purpose."

Summary Exercise

1. List the letter of the five opinions with which the ranchers and coal producers most frequently agree or disagree.

RANCHERS		COAL PRODUCERS	
Agree	Disagree	Agree	Disagree
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

2. Which opinions held by ranchers and coal producers today would have been held by these groups during the first westward expansion of the 19th century?

RANCHERS	COAL PRODUCERS

3. What opinions have probably changed since then?

Analysis of Arguments

1. Review the ranchers' and coal producers' opinions. Does one group have a superior argument? Why or why not?

We have all made statements like those of the ranchers and coal producers. War, welfare, territorial possessions, the death sentence, busing, arguments with parents and friends - all produce strong feelings. Often, we are overprotective of our opinions. We try to impose them on others and in the end learn very little and seldom convince others that we are correct. Let us, therefore, reexamine the ranchers' and coal producers' opinions in light of three factors we need to keep in mind when arguing about anything.

a. The Emotional Appeal of Words
b. The Ambiguity and Bias of Words
c. Factual Evidence

a. The Emotional Appeal of Words

Words can have both a descriptive meaning (the dictionary meaning) and an emotional meaning based on positive or negative feelings aroused by the use of these words. For example, "pencil," "chair," or "glass" probably have only descriptive meanings, but "coal," "strip-mining," and "boom towns" have not only descriptive meanings but emotional connotations as well which produce a variety of negative or positive feelings depending on one's past experience. People use emotional words to sway others to accept their point of view.

Questions

1. Reread the rancher and coal producer arguments, select four emotional phrases and then complete the chart below:

Number of the Statement	Emotional Word or Phrase	Emotional Connotations

2. Try rewriting Speaker 3's argument, eliminating all the emotional words and using only descriptive words. What's the effect?

b. The Ambiguity of Words

We know that words have both descriptive and emotional meanings. Words can also be ambiguous and biased. An ambiguous phrase is not specific enough to be understood out of context. Words used to communicate personal feelings which are not necessarily part of a general outlook on life show the speaker's bias, his/her opinion.

Go through the rancher and coal producer arguments looking for words or phrases that are ambiguous and/or biased. Write these in the chart below.

Words or Phrases With Unclear Meanings	Why Ambiguous or Biased

c. Factual Evidence

Finally, consider how much factual evidence the ranchers and coal producers used in supporting their opinions. People like to say their opinions are absed on facts, not merely on their feelings.

1. Complete this chart by listing the facts in each speaker's opinion.

Speaker	Facts

2. Analyze the value of each fact by using the questions below.

   a. Is the source of the information firsthand, common knowledge, or hearsay?

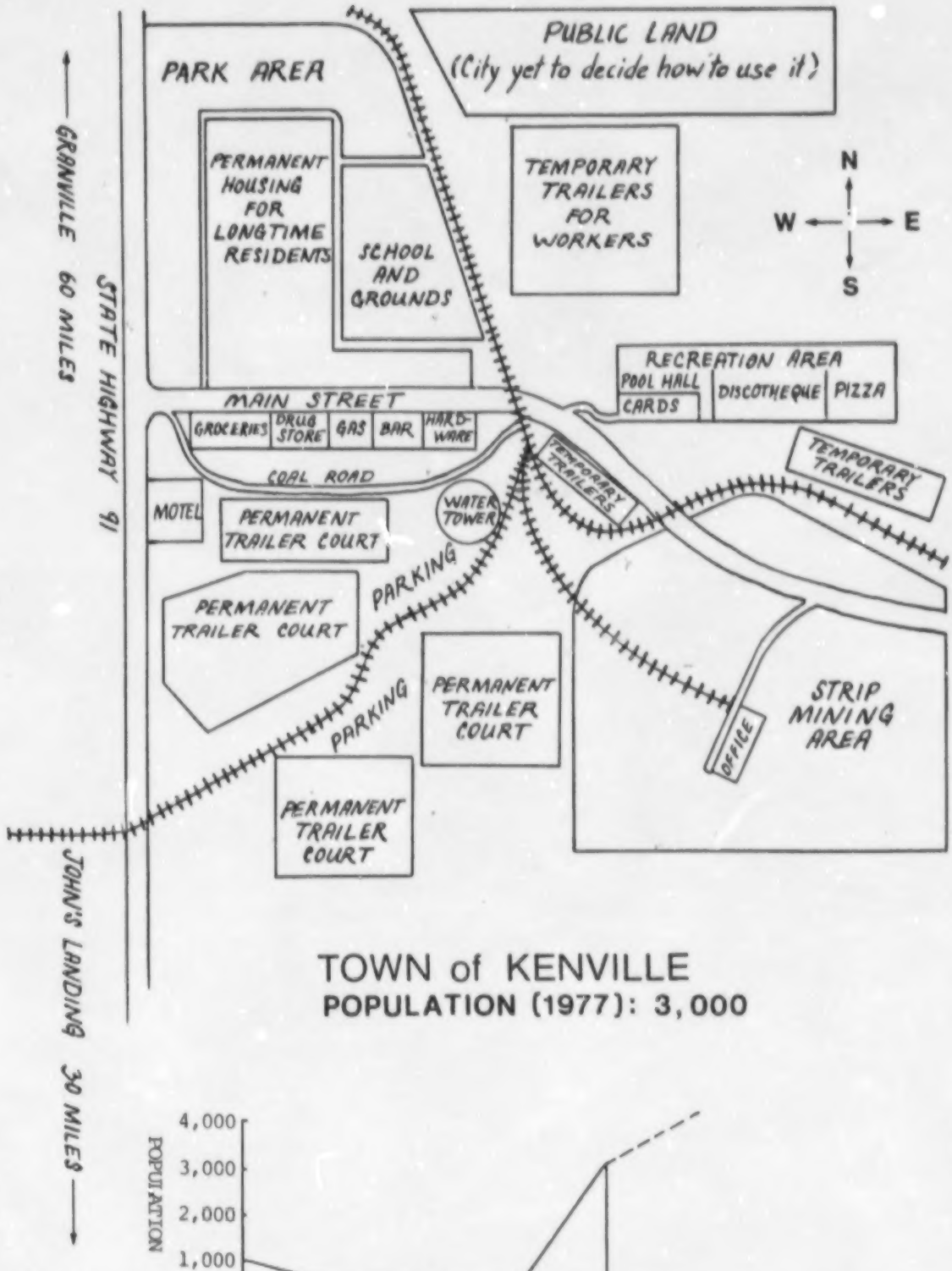
   b. Does the source support of weaken the fact?

   c. Can the fact be supported by further research?

   d. Do you think the source of the information influences the speaker's credibility? How?

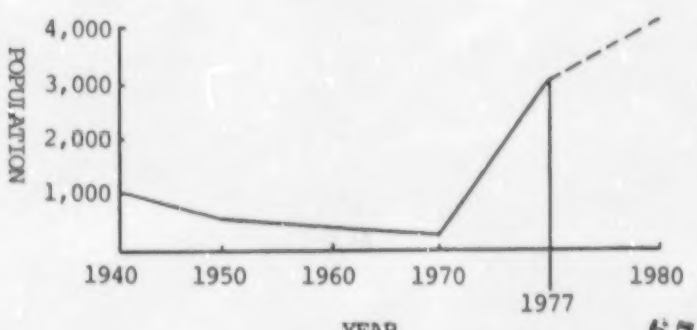
3. Now go back to the first question(in the Summary Exercise) in which you explained whether or not the ranchers or the coal producers had the superior argument. Did you change your opinion?

Lesson 4
Map



TOWN of KENVILLE

POPULATION (1977): 3,000



Lesson 4
Student Activity Sheet

What Happens When There is Coal on Your Doorstep?

Part 1

When hundreds of new families start moving into a sleepy rural town, what's in store for the town's former way of life? What compromises will new families have to make? Can facilities like sewers and water handle the new growth? These are some important questions that call for urgent answers in any boom town.

Imagine that you are a reporter for the school paper assigned to take a set of slides to a council meeting in support of a series of articles you have written under the title: STUDENTS SPEAK OUT.

At the town council meeting present your handmade map of the town. Give your talk as if each member of the council were answering your questions about the map of Kenville. Write the responses you think the council members will make.

1. You and your family have just moved into Kenville. Where will you probably have to go to find a place to live for a couple of months?

2. Then after a few months, where will you be most likely to move to? Why?

3. You earn good money - $75.00 to $90.00 a day. Even with saving a lot each month, why won't you be able to buy your own home for many years?

4. Which of the following facilities in the town might be stretched beyond their capacity to offer good reliable services in a year or two? (Use a check mark.)

_____ Tenley Memorial Hospital (24 beds)
_____ Public Schools
_____ Parks and recreation centers
_____ Town water pipes and sewer lines
_____ Wells and water supply system
_____ Shopping places
_____ Police and fire protection
_____ Single-family homes or apartments
_____ Specialists: doctors, dentists, lawyers, teachers, librarians, tradespeople

What others can you think of? Write them in the space below. Remember to use the map in making your choices.

5. In your opinion, why doesn't the housing pattern in Kenville show a proper balance?

6. Look carefully at the map. What might two complaints be from young people in Kenville?

7. Oldtimers in Kenville don't want anyone telling them what they can do with their land. List some of the other fears older residents might have about the big mining project. List them under headings:

Environment

Economy

Social Change

Part 2

1. Turn now to the Selected Readings. After you finish each, write the problem that the reading highlights. Use the headings:

   Personal Problems Public/Social Problems

2. The readings illustrate the fact that boom towns face many challenges. If you were the town director of development in a western village that lies near a large new mining project, what problem would you want to solve first? What would you do?

3. Think back to the people described in the readings. Then, acting in your capacity as director of development, how would you help these newcomers develop a sense of belonging? List your ideas.

Part 3

Take part in the research/report project on alternatives to the boom town syndrome found at the end of the Selected Readings.

Lesson 4
Selected Readings

The little girl was about four, with blonde hair and large, sad eyes. She sat quietly and said nothing while a nurse cleaned her infected ears and changed the filthy clothes she was wearing.

"When we found her she was curled up in a baby's crib in a trailer about five miles out of town," said Robert Weisz, a psychologist and director of the Northern Wyoming Mental Health Center here. The girl's mother was having a nervous breakdown and her father was a construction worker who was having trouble holding a job.

"She couldn't talk and she was functioning like a child of just over a year when we found her," said Weisz. "She's a beautiful child, but she's having a hard time relating to anyone anymore."

"The silent little girl is just part of a trend that is growing here and in other energy boom towns springing up in the West from Montana to New Mexico..."

...Frontier families in the past, and migrants in the West today, have faced similarly unsettled lifestyles, but they have usually had strong family ties to help stabilize life for children...

...The ragged trailer camps have been thrown up so fast that local officials complain raw sewage lies frozen on the ground in some encampments...

...Part of the problem, according to several experts, is that parents in boom towns are often young themselves - the average age here is under 25 - and have never learned to accept the responsibilities of rearing children.

...A neighbor stopped in at the trailer of Debee and William Rener. When the neighbor left, she told the Reners she was going "honky-tonking" in the local bars that night.

"She's leaving a 4-year old in a 1952 trailer with an open coal stove and an 8-year old in charge," Mrs. Rener said. "You wouldn't believe the neglect here by parents for their children. Drive down the street at night and you can see little ones sitting alone in cars parked outside the bars."

Her husband, a foreman on a construction crew, added, "People who come here are doing it for the money and nothing else. We're pulling out next summer. I wouldn't stay in this God-forsaken hole for all the money in the world."

...child abuse and neglect here has gone up fourfold in the last three years. Ninety such cases were handled by Weisz' clinic last year and this year the load is heavier, he said...

...There are fights, alcoholism, drugs, long working hours, depression and constant movement...

..."The result is a high incidence of learning disabilities, behavioral disorders and of kids who just can't deal with conflict. Later in life these kids are going to have some hangups to deal with," he said.

Source: The Washington Post (December 13, 1976), pp A1, A4

...Gillette is probably in better shape to cope with its unnatural growth.

City officials here have had the benefit of experience - and more important, tax revenues - from the last oil boom. They have used oil tax money from that boom to build several new schools, hire additional teachers at the state's highest salary rates and construct a recreation center with a budget higher than any other recreation budget in Wyoming.

...contrast to Gillette, officials here point to other newly forming boom towns that do not have any services...

One such community is Wright, Wyoming, which officials here point to as the prototype of the boom towns to come. The isolated little outpost has a collection of about 60 trailers and was set up recently to supply workers for a new strip-mining operation to be run by the Atlantic Richfield Company.

The nearest community to Wright is Gillette which is 38 miles away. The only amenities, according to Gillette officials, are several portable classrooms, a post office and a bar - all in trailers.

But someday within the next few years, a Campbell County official predicted recently, there will be 6,000 persons living in Wright. "We know it's coming," he said, "but when it does, we have no idea what will happen to those people."

Source: The Washington Post (December 13, 1976), p A4

Note: There has been considerable improvement work done by Atlantic Richfield Company for the town of Wright between the years 1977 and 1979. The company, acting through its wholly-owned subsidiary, Housing Services, Inc., has constructed among other things a shopping center, a permanent elementary school, and a community center. In addition, a 40 unit apartment complex is being set for completion in the spring of 1979.

ARCO officials believe that their productive efforts, along with the close cooperation of Wyoming citizens and their state and local agencies, will create a town that people want to live in and enjoy.

Long range plans for the town of Wright include its eventual incorporation. The town will then be directed by officials elected by the residents.

...Colstrip is like Gillette, only more so. The trailers actually surround Montana's two major power plants in a semi-circle, nestled snugly in the unreclaimed ruins of an old abandoned mine.

Randy Stevens has worked on oil rigs in several western states and comes to Colstrip by way of the Alaska pipeline. "This isn't such a bad towr.," he says, "but there isn't much to do." He adds that his wife is bored and that they want to move as soon as they can afford it...

Many coal people are like the Stevens: refugees from other boom towns and headed for the next one, drawn by rumors of jobs and plenty of pay. (The base rate for a miner in Colstrip is $50 to $60 a day.)

Gillette has a 30-bed hospital which was built in 1951, when the town numbered 2,190. The same hospital now serves 14,000. There are six practicing physicians in Campbell County - one for every 2,300 people...

In 1975 rancher Bill Gillin's daughter had eight third-grade teachers due to split classes and resignations. Another daughter wanted to specialize in Spanish during her senior year in high school. But the course was dropped after six weeks because English classes were so overloaded they had to be split and the school's only Spanish teacher was transferred...

...Gillette looks like a trailer park, with mobile homes nearly aligned, row after row. Inexpensive and easily manufactured, trailers are popular in boom towns...

Local ranchers try to live up to America's cowboy mythology. They see themselves as rugged individualists battling drought, hard winters, low beef prices and government interference all at the same time. Traditionally they have demanded - and received - little in the way of public service from local government. But the arrival of the 'urban' populace is forcing a change: suddenly the ranchers must provide, through their taxes, for the boom towns. And a lot of them don't like it.

Gillette school enrollment, for example, is about 3,300, up nearly 50 percent since 1970. It is expected to double by 1985...

...The town built a new elementary school recently to relieve some of the crowding so classes could be moved from the temporary trailers. But by the time it was finished, enrollment had increased so much that the new building could handle only grades three through six...

It doesn't take long to identify the main business in Colstrip. From the windows of the town's only motel one can see drag lines and coal shovels operating 24 hours a day.

The 1970 census reported that 422 persons lived in the Colstrip Census Division of Rosebud County. Estimates in July 1974 placed Colstrip's population at 2,246. Many of the recent arrivals are the new nomads, following the nation's energy boom from state to state.

Source: Whipple, D. Sawyer, "The Social Costs of Coal." Environmental Action, September 11, 1976.

LOOKING TO THE FUTURE

Activity 1

Research

Good ideas for better living conditions for people living in boom towns can be found with a little research. Begin by examining the written material in your school library, especially magazines and periodicals. Then write to your Representative or Senator. Contact energy development companies--coal, oil, natural gas and uranium.

For example, take the information about the way the citizens of Paonia, Colorado and the Westmoreland Coal Company pretty well avoided the boom town syndrome by employing local residents and keeping agricultural features intact.

Westmoreland didn't only buy a mine in Colorado; it also entered the orchard (apples, peaches, cherries) business and ranching when it acquired the rights to land needed for a railroad spur.

Very early in the land acquisition it became clear that the economy of the North Fork Valley depended on the orchard and ranching operations. The coal company decided it would be in the best interests of all to keep them both going. An added incentive was to demonstrate that coal mining and agriculture could co-exist.

The mine was named the Orchard Valley Mine. It operates today primarily with local help. So far, there have been enough residents to work in the mine. As operations expand, there will be some additional help required from outsiders. But, according to mining projections, the total will not exceed 200. The town of Paonia is planning ahead now for this gradual increase in population.

By using local people to work in the underground mine, the coal company has been able to accomodate women workers as well as men. At present, over 10 percent of the 125 miners working in the mine are women. These women, like their male counterparts, are almost entirely town and county residents who come to the mine with or without mining experience.

Source: Westmoreland Coal Company
2500 Fidelity Building
Philadelphia, Pennsylvania 19109

Activity 2

Report

When you have completed your research, report on one of these interesting alternatives to traditional boom towns, such as the experiences of Paonia, Colorado.

Make your report part of a simulated meeting of regional directors of development.

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